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ABSTRACT

The new vocationalism in education could be said to be an effect of changes in the greater society--arriving after the changes have already happened. There has been a shift in the nature of the advanced capitalist countries, such as the United States. Giant companies have, through advances in communications technology, become able to control worldwide businesses through a single headquarters in a major city. Along with these developments, the western democracies have poured huge sums into military weaponry, which requires increasingly sophisticated technology. Relying on new technology, industries have abandoned the old factories of center cities and relocated in new facilities in the suburbs, leaving decaying city cores. This has been aggravated by a tendency for the headquarters of multinational firms to locate in big cities such as London and New York, close to expert financial centers and universities; cash flows to them, draining subsidiary companies in other locations. High-tech production needs a small (20 percent), highly qualified technical work force for research, development, management, and maintenance, and a much larger (80 percent), semiskilled or unskilled work force for production. The gulf in pay for these two classes of workers is widening. The 20 percent who are highly skilled and qualified are increasingly likely to be drawn from those who have had higher education, while other ways of training and getting relevant experience increasingly are being closed off. At the same time, education has been moving toward more job-oriented content, training students for jobs that will change rapidly. What is needed is an educational system that can give workers basic skills, flexibility, and ability to learn ever-changing job content. (KC)

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A HIGH TECH FUTURE

Audrey Nettle

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A HIGH TECH FUTURE.

Audrey Nettle
April, 1986.

The new vocationalism in education could be said to be an effect of changes in the greater society in which we live - arriving after the changes have already happened. In this paper I would like to suggest that the need to emphasize vocationalism in education goes back at least a couple of decades, to seek an explanation for this, and to discuss some of its implications for young people going through the educational system.

Baran andSweezy (1966) pointed out that there had been a shift in the nature of the advanced capitalist economies, such as the U.S.A. The mergers of monopoly firms which were already enormous into corporate giants with resources that could rival nation-states was bringing about a number of changes. In particular, with improvements in the speed of travel and much better communication systems, the corporate giants could buy raw materials and labour in the cheapest markets worldwide, and concentrate on maximising profits in the advanced countries, where there is much greater affluence. Technological developments, such as faster long-distance planes, satellite communications, improved radio and telephone links, television, optic fibre networks, enabled the new multinational companies to control world empires from their home cities - for example, Ford Motors in Detroit.

The big cities housing such headquarters saw a rapid expansion of services such as banking, auditing, legal advice, advertising, and so on (Bowles, Gordon, and Weisskop , 1983). One effect of this was to concentrate the location of the headquarters of multinational firms in such world cities as New York, London, and Los Angeles, in which can be found highly sophisticated and dynamic infrastructures for the business world (Firestine, 1977). From the 1960s, office blocks have come to dominate these inner city skylines, replacing the churches and cathedrals of earlier times: the palaces of high technology are ousting god.

Alongside these developments, since the end of the Second World War, the economies of the U.S.A., Great Britain, France, and other technologically advanced countries in NATO have poured wealth and resources into developing one of the most massive military machines ever known. James O'Connor (1973) sees this partly as a consequence of the spre of American interests overseas and a continuing need to protect markets in which its multinationals operate from overt socialism, with its constant threat of nationalisation of private, profitable business concerns, and restrictions on the exploitation of labour. He also sees the 'Warfare State' as a soaker-up of surplus capital, and in this it is functional in the maintenance of capitalism as the dominant economic system. As capitalism is healthiest when it is expanding, the disposal of surplus capital is vital to it.

Surveillance apparatus and weapony produced for the Cold War confrontation between the NATO and Comintern countries has incorporated more and more high technology, and goverments have supported military research and development with considerable funds: constant innovation has been the order of the day, as existing products rapidly became obsolete in the competition between the Soviet Union and the U.S.A. Just as some cities have come to be dominated by the headquarters of multinationals, so other areas have become dominated by military complexes and production - for example,Los Angeles, Dallas,San Antonio (Markusen and Bloch, 1985). The special needs of military gadgetry and speed of innovation needs a highly skilled and highly qualified workforce, but much of what they produce isdestructive or useless, rather than constructive. This 'warfare' part of the state could be described as a syphon that draws off huge resources in funds and qualified manpower from the rest of the community. In return, Markusen and Bloch suggest it imparts through its personnel conservative, patriarchal, and promilitary cultural attitudes that are anti-cosmopolitan, anti-labour, and anti-liberal. With the far-reaching interests of the multinationals and the size of military investment, it is not surprising that the former intermesh with the latter.

A third factor in the shift to a form of corporate capitalism is what Braverman (1974) described as the 'deskilling of labour'. He has identified a trend in which many formerly skilled, craftsmen-like jobs are reduced to a multiple of simple 'one-off' operations, each one performed by one worker who does very little else, and contrasting sharply with the craftsman in earlier industries who designed his product as well as manufacturing it. The father of the production line, F.Taylor, demonstrated how to apply deskilling to manufacturing industry in the 1920s, together with its sequal, the separation of mental from manual labour, or the planning and creative aspects of production from the execution. The spin-off here was an increasing separation of management from the workforce, increasingly controlled by a new breed of supervisors. Braverman has traced the growing pervasion of Taylorism in many other occupations, such asclerical work and services, and the growth of an increasingly divided and segmented workforce.

At the same time, there has been an increasing organisation of that part of the workforce formerly looked on as 'professionals' into associations and trade unions - for example, doctors and teachers. As the demand for lawyers, accountants, teachers, nurses, and other highly-qualified workers has increased because of the need to service a growing welfare state and the highly developed bureaucracies in the state and big corporations, members of professions have lost a former autonomy of work and experienced de-skilling (Johnson, 1982) . Though this has not been without opposition, the overall effect is a restructuring of the workforce, and the exclusion of the skilled craftsman from many of his traditional roles - which, in turn, has served to decrease the power of trade unions and their influence with employers to the benefit of workers, since apprentice-trained craftsmen have been the backbone of the trades union movement (Edwards, 1979; Esland and Salaman, 1980). As the craftsmen and journeymen have disappeared, so has the system of training through apprenticeships. But, at the same time, increasing automation through the use of robots and computers in the production process is giving increased importance to technicians, the highly qualified trouble-shooters of such installations as oil-refineries - where a breakdown can be highly damaging to plant and profits (Gallie, 1978).

Since 1945, with military technology rapidly becoming more innovative and sophisticated, and the advent and development of ever cheaper computers with more sophisticated fuctions and capacities, the spearhead of innovation and development in industrial production and business operations has come to be organised around the use of high technology products. New communications systems have proliferated - television, satellites, telephones, VHF radio, video, optic fibre networks, computers,and other forms of telecommunications. Since the mid 1970s considerable efforts have gone into improving networks of communications, so that today instant contact with colleagues on the other side of the globe is readily available (Nicol, 1985).

At the same time, industry that relies on high technology for production has need of different buildings from the older, labour-intensive production units: high tech can substitute a workforce counted in tens for one that formerly numbered hundreds. Together with the relocation of industry from the old industrialised nations to the Third World (Fröbel et al., 1980) there has been a marked movement of wealth-producing industries within industrialised countries, for example from the Northeast of the United States to the 'Sunbelt', and from central London in the United Kingdom to the M4 Corridor. Government funds and regional development plans have aided this tendency (Castells, 1985; Hall, 1985).

These movements have had dire effects on the inner city areas of old manufacturing centres. Relocation from outdated sites has led to the destruction of factories on a large scale, as has happened in West London and in the West Midlands in the United Kingdom, leaving a skilled workforce that cannot use its skills (GLC, 84). At the same time, with better wages post-war and the establishing of new industries in the outer suburbs, many better-off families have moved out from city centres to the suburbs - a trend reinforced by government creation of

New Towns such as Bracknell and Milton Keynes in the United Kingdom: these were established after 1945 to relieve congested areas in London, and to attract new industry. The empty spaces in the city centres were increasingly filled from the 1940s onwards by newly-arrived immigrants, who filled the unskilled labouring jobs in the older factories, and worked in conditions that were becoming unacceptable to the native workforce which was now better educated and more conscious of its rights. As these old factories have closed and been knocked down, unemployment has soared among the immigrant population, especially for those who are coloured. The inner cities have encountered financial problems as the production of wealth has declined within them - and the payment of local taxes, the basis of city revenues - so that services and superstructure have not been maintained to the same standards as in the suburbs (Breghenfeld 1977).

This has been aggravated by a tendency for the headquarters of multinational firms to locate in big cities such as London and New York, close to expert financial centres and prestigious universities or military sites: with cash-flows moving towards headquarters, and research and development located there, the locations of subsidiary companies have been drained of cash and talent: in other words, the present-day business and high tech centres have tended to profit at the expense of all other locations. Cohen (1977) examined in detail the situation within the Sunbelt in the U.S.A., while the M4 Corridor in the United Kingdom is illustrative of a similar tendency.

High tech production needs a small, highly qualified technical workforce for research, development, management, and maintenance, and often uses a much larger, semi-skilled or unskilled workforce for production (which may include women in large numbers). Currently this ratio of highly qualified to unskilled has been estimated as approximately 20% highly qualif ied to 80% unskilled (Saxenian, 1985). There is a trend towards a small, highly skilled and highly paid workforce, and a large but poorly paid workforce, with pay differentials between the two types of workers tending to widen. Coupled to this is a necessity for continuing innovation and rapid change, which leads to a preference for a young, newly-trained workforce situated in a union-free environment where the need for rapid implementation of innovation will not be restricted by job definitions and other forms of restrictive practise, or lengthy negoiations about change. Add new buildings, served by good transport and communications, and the suburbs become highly desirable for new factory and business locations (Bookchin, 1977).

What will be the effects on education as the use of high technology increases in production, and firms struggle to be competitive ? The 20% highly skilled and qualified are increasingly likely to be drawn from those who have had higher education, since other ways of training and getting relevant experience will increasingly be closed off as jobs become deskilled. In terms of schooling in the United Kingdom, 20% represents a smaller number than those who are successful at passing 4 or more O Levels at the present day, which may pressage a shrinkage in the total number of students undertaking higher education. The ones who do progress that far will need the type of qualification that will enable them to carry out and maintain complex industrial or business operations, or enter one of the service professions such as law, health-care, or education, that props up corporate capitalism by providing a healthy and educated workforce. As their role is more likely to be maintenance than development, one might question whether many entrants to higher education - if any - will be encouraged to study liberal or creative subjects, or philosophy, or to pursue any of the Humanities 'out of interest', before facing the necessity to train for employment. Pressures are mounting from all sides to make the content of study job-specific - in an age when the contents of jobs are changing quicker than ever before in history. One must question what will be lost as this comes about, but recent moves by the MSC in the United Kingdom, such as vetoing the discussion of controversial topics among students on training courses sponsored by the agency, suggests that this specualtion has moved beyond being merely academic.

The 80% majority are likely to find their future employment in semi-skilled but white-collar jobs, or in services - which now account for some 55% of GNP in earnings, and have seen a rapid expansion since the 1960s. Since these jobs are low-paid, many

women are likely to make their income from them, since the better-paid jobs are still, by and large, occupied by men.

A lot of school-leavers, especially girls, are likely to need an adequate general education, especially in literacy and numeracy, together with personal qualities that can cope with change, get on with people, be good at communicating, and competent at finding out facts and information, storing it, and retrieving it. Some traditional vocational skills will remain relevant, but these are rapidly being replaced by number-controlled manufactures (as in the case of joinery and sewing). They will need a favourable attitude to high technology, but not control over it - the ability to play computer games, but not to use the system to swindle the bank.

Education for personal growth and satisfaction, together with the survival of the manual crafts, now seems a matter for political choice - shall education give access to them or not ?

The new vocationalism is not a bolt from the blue, but has its roots in tangible reality.

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